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(54) Liquid Detergent Containing Taurate and Sarcosinate Surfactants

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(30) (US) U.S.A. 884,687 1986/07/11

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A LIQUID DETERGENT COMPOSITION  
CONTAINING TAURATE AND SARCOSINATE SURFACTANTS

ABSTRACT OF THE DISCLOSURE

Liquid detergent compositions comprising at least one taurate surfactant, at least one sarcosinate surfactant, and from 1% to 30% of at least one auxiliary surfactant, wherein the ratio of the taurate surfactant to the sarcosinate surfactant is from 1:3 to 3:1 and the total level of surfactant in the detergent composition is from 2% to 40%.

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A LIQUID DETERGENT COMPOSITION  
CONTAINING TAURATE AND SARCOSINATE SURFACTANTS

ROBERT J. MAILE, JR.

TECHNICAL FIELD

The present invention concerns liquid detergent compositions which are mild, provide a lather of aesthetically pleasing character, and comprise a particular mixture of surfactants.

BACKGROUND OF THE INVENTION

Liquid detergent compositions, such as hand cleaners, shower or bath cleaners, and shampoos, are staple items of commerce in modern societies. They are used by consumers to remove soil from the hands, the body, and the hair. If such products are to find wide acceptance among consumers, they must be mild (i.e., they must not be harsh or irritating to the skin), they must clean effectively, and they must possess pleasing aesthetic attributes or characteristics. Among the more important aesthetic attributes is the character of lather produced by the composition during use, with lather of high volume and exceptional creaminess being particularly desirable.

A number of references disclose detergent compositions. For example, Japanese OPI 61-63198, published December 15, 1981, discloses mixtures of anionic sulfate surfactants and betaine surfactants. U. S. Patent 3,980,769 Issued September 14, 1976, to Chilardi et al., discloses detergent compositions containing a

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mixture of anionic and amphoteric surfactants. U. S. Patent 4,110,263 issued August 29, 1978 to Lindemann et al., also discloses detergent compositions containing anionic and amphoteric surfactants. U. S. Patent 4,310,433 issued January 12, 1982, to Stiros discloses an aqueous liquid detergent composition comprising saturated and unsaturated potassium soaps and free fatty acid. U. S. Patent 4,472,297 issued September 18, 1984, to Bolich, Jr. et al., discloses liquid detergents which are cosmetically attractive and which contain a hydroxyl propyl guar gum, an alcohol, a surfactant, water and an electrolyte as essential components. U. S. Patent 3,085,067 issued April 9, 1963 to Anderson discloses a sarcosinate-based detergent composition formulated from a combination of ingredients so selected and so proportioned that outstanding lathering and other characteristics are obtained.

Accordingly, it is an object of the present invention to provide a liquid detergent composition which is mild and which possesses exemplary lathering characteristics in use.

It is a further object of this invention to provide a liquid detergent composition comprising a mixture of a taurate surfactant and a sarcosinate surfactant in combination with an auxiliary surfactant.

#### SUMMARY OF THE INVENTION

The present invention relates to liquid detergent compositions comprising at least one taurate surfactant, at least one sarcosinate surfactant, and an auxiliary surfactant. The ratio of the taurate to the sarcosinate surfactant is from about 1:3 to about 3:1. The total surfactant present is from about 2% to about 40% of the composition, while the auxiliary surfactant itself is present at from about 1% to about 30%. It has been surprisingly discovered that such detergent compositions comprising these mixtures of taurate and sarcosinate surfactants are mild and exhibit unexpected volumes of lather possessing

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unexpected creaminess and silky skin feel as compared to compositions comprising only one or the other of these surfactants.

As used herein, unless otherwise stated, all ratios are by weight and all percentages are by weight of the composition.

#### DETAILED DESCRIPTION OF THE INVENTION

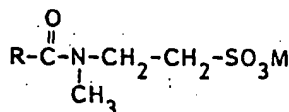
While this specification concludes with claims particularly pointing out and distinctly claiming the present invention, it is believed that the invention can be more readily understood from a reading of the following detailed description and the appended nonlimiting claims.

The liquid detergent composition comprises at least one taurate surfactant, at least one sarcosinate surfactant, and an auxiliary surfactant.

The essential components of the present invention are discussed in the following paragraphs.

#### Taurate Surfactants

The taurate surfactants useful in the present invention are the salts of fatty acid amides of N-methyltaurine. They conform generally to the structural formula:



where  $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-$  represents a fatty acid radical and M represents sodium, potassium, ammonium, or triethanolamine. Fatty acids having carbon chain lengths of from about 10 to about 20, including those derived from coconut, palm and tall oil, can be used. Preferably, the fatty acid is derived from coconut.

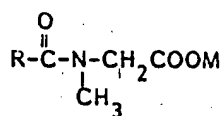
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Preferably, sodium salts are used. The most preferred taurate is sodium methyl cocoyl taurate. This taurate surfactant is sold under the trademark Igepon TC-42 by GAF Corporation of New York, New York. The taurate surfactant is preferably present at from about 0.5% to about 10% of the detergent composition.

#### Sarcosinate Surfactants

The sarcosinate surfactants useful in the present invention are N-acyl sarcosinates which are salts of condensation products of fatty acids with sarcosine. They conform generally to the structural formula:

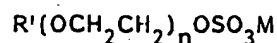


where, as above,  $\text{R}-\overset{\text{O}}{\parallel}\text{C}-$  represents a fatty acid radical and M represents sodium, potassium, ammonium, or triethanolamine. Fatty acids having carbon chain lengths of from about 10 to about 20, including those derived from coconut, palm, and tall oil, can be used. Preferably, the fatty acid is lauric acid. Preferably, sodium salts are used. The most preferred sarcosinate is sodium lauroyl sarcosinate. This sarcosinate surfactant is sold under the trademarks Hamposyl L-30 and Hamposyl L-95 by W. R. Grace & Co. of Lexington, Maine. The sarcosinate surfactant is preferably present at from about 0.5% to about 10% of the detergent composition.

The taurate and sarcosinate surfactants are present in the composition at such levels that the weight ratio of taurate to sarcosinate is from about 1:3 to about 3:1.

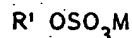
### Auxiliary Surfactant

The auxiliary surfactant can be any of the various surfactants commonly used in liquid detergent compositions designed for personal care uses. The present invention is exploited to its fullest when the auxiliary surfactant is a low lathering material. Especially preferred are the salts of sulfate esters of the polyethylene glycol ethers of fatty alcohols; these materials have the general structural formula:



In this formula, R' represents the fatty alcohol moiety; M represents, as before, sodium, potassium, ammonium, or triethanolamine; and n is a number between 1 and about 15. Preferably, the fatty alcohol is lauric alcohol. Preferably, M is sodium. Preferably, n is between 1 and 4 with an average value of n of 3 being particularly preferred. An especially preferred auxiliary surfactant is sodium laureth sulfate.

Also preferred are alkyl sulfate surfactants. These materials have the following general structural formula:



As before, R' represents a fatty alcohol moiety and M represents sodium, potassium, ammonium, or triethanolamine. Fatty alcohols having carbon chain lengths of from about 10 to about 20, including those derived from coconut, palm oil and tall oil, can be used. Preferably, the fatty alcohol is lauryl alcohol. Preferably, sodium salts are used. The most preferred alkyl sulfate is sodium lauryl sulfate.

Another class of materials suitable for use as auxiliary surfactants are the monoalkyl phosphate surfactants. A preferred member of this class is sodium dodecyl phosphate.

Mixtures of auxiliary surfactants can be used.

Preferably, the the auxillary surfactant is present at a level of from about 1% to about 30%.

#### Water

Water is a necessary component of the present invention. The water is preferably deionized and is preferably used at levels of from about 60% to about 98%.

#### Optional Components

The compositions herein can contain a variety of non-essential optional components suitable for rendering such compositions more acceptable to consumers. Such conventional optional ingredients are well known to those skilled in the art. They include preservatives such as benzyl alcohol, methyl paraben, propyl paraben, and imidazolidinyl urea; thickeners and viscosity modifiers such as the diethanolamide of long chain fatty acids (e.g., PEG-3 lauramide), block polymers of ethylene oxide and propylene oxide (such as Pluronic F-88 offered by BASF Wyandotte of Wyandotte, Michigan), sodium chloride, sodium sulfate, polyvinyl alcohol, and ethyl alcohol; pH adjusting agents such as citric acid, succinic acid, phosphoric acid, sodium hydroxide, sodium carbonate, etc.; silicone fluids; perfumes; dyes; hydrotropes such as ammonium xylene sulfonate and potassium toluene sulfonate; sequestering agents such as disodium ethylenediamine tetraacetate; lather modifiers such as coconut monoethanolamide; any of the various deodorant systems used in personal care products, such as triclocarban (TCC) and triclosan (Irgasan DP-300); and polymers such as polyquaternium-10 (UCARE Polymer JR-400 as made by Union Carbide Corporation of Danbury, Connecticut), hydroxylpropyl guar (Jaguar HP-60 as made by Celanese Plastics and Specialities Company of Louisville Kentucky), guar hydroxypropyltrimonium chloride (Jaguar C-145), polyquaternium-7 (Merquat 550 as made by Merck &



Company, Inc. of Rahway, New Jersey), and hydroxyethylcellulose. Such optional components are used individually at levels of from about 0.01% to about 10%, preferably from about 0.1% to about 5% by weight of the composition.

The pH of the present composition is not critical, but generally is in the range of from about 4 to about 8.

#### Methods and Manufacture

Any convenient method of manufacture as is commonly used in the industry, such as mixing the ingredients in a simple batch operation, can be used.

#### Form of Product

The compositions of this invention are usually supplied as pourable liquids in containers ready for use by consumers. In this situation, the consumer dispenses the liquid as a liquid from the container and uses it with water to clean his or her hands, body, or hair.

Optionally, the compositions can be supplied as aerosol products as well known by those skilled in the art. In this particular situation, the product is dispensed as a foam and is then used by the consumer with water to clean his or her hands, body, or hair. In aerosol products, the taurate and sarcosinate surfactants are each preferably present at from about 0.1% to about 7.5% and the auxiliary surfactant at from about 1% to about 20%; the total surfactant present is preferably present at from about 2% to about 30% of the composition. The above noted ratio of taurate surfactant to sarcosinate surfactant must be maintained. Water preferably comprises from about 70% to about 98% of the composition. These aerosol products also incorporate any of the various propellents, (such as hydrocarbons, fluorocarbons, nitrous oxide, etc.) well known to those skilled in the art.

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Optionally, the compositions can be supplied as pastes as well known to those skilled in the art. In this particular situation, the product is dispensed, as from a tube, and used by the consumers in a manner similar to a liquid product to clean his or her hands, body, or hair. In paste products, the taurate and sarcosinate surfactants are each preferably present at from about 1% to about 20% and the auxillary surfactant at from about 3% to about 50%; the total surfactant present is preferably present at from about 5% to about 70% of the composition. The above noted ratio of taurate surfactant to sarcosinate surfactant must be maintained. Water preferably comprises from about 30% to about 95% of the paste detergent composition.

The following example is presented by way of illustration and not by way of limitation.

EXAMPLE

Sodium laureth sulfate	10.00%
Sodium methyl cocoyl taurate	1.8
Sodium lauroyl sarcosinate	2.25
Coconut monoethanolamide	4.00
Opacifier	1.00
Citric Acid	0.25
EDTA	0.1
Irgasan DP-300	0.3
TCC	0.15
Dye	0.01
UCARE JR-400	0.75
NaCl	0.3
Perfume	0.12
Glycerine	1.0
Water	qs100

The various components are mixed to form a liquid detergent composition. When this composition is used by a human consumer as a hand cleansing product, it cleans the user's hands in an

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efficient manner and, during use, produces a high volume of extraordinarily creamy lather.

What is Claimed is:

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOW:

1. A liquid detergent composition comprising:

- (a) at least one taurate surfactant;
- (b) at least one sarcosinate surfactant; and
- (c) from about 1% to about 30% of at least one auxiliary surfactant;

wherein the weight ratio of said taurate surfactant to said sarcosinate surfactant is from about 1:3 to about 3:1 and wherein the total level of surfactant present is from about 2% to about 40%.

2. The detergent composition of Claim 1 wherein the level of said taurate is from about 0.5% to about 10%.

3. The detergent composition of Claim 1 wherein the level of said sarcosinate is from about 0.5% to about 10%.

4. The detergent composition of Claim 1 wherein the level of said taurate is from about 0.5% to about 10% and the level of said sarcosinate is from about 0.5% to about 10%.

5. The detergent composition of any one of Claims 1, 2, 3, or 4 wherein said taurate is sodium methyl cocoyl taurate.

6. The detergent composition of any one of Claims 1, 2, 3, or 4 wherein said sarcosinate is sodium lauroyl sarcosinate.

7. The detergent composition of any one of Claims 1, 2, 3, or 4 wherein said taurate is sodium methyl cocoyl taurate and said sarcosinate is sodium lauroyl sarcosinate.

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8. The detergent composition of any one of Claims 1, 2, 3, or 4 wherein said auxillary surfactant is selected from the group consisting of salts of sulfate esters of polyethylene glycol ethers of fatty alcohols, alkyl sulfate surfactants, and mixtures thereof.

9. The detergent composition of Claim 5 wherein said auxillary surfactant is selected from the group consisting of salts of sulfate esters of polyethylene glycol ethers of fatty alcohols, alkyl sulfate surfactants, and mixtures thereof.

10. The detergent composition of Claim 6 wherein said auxillary surfactant is selected from the group consisting of salts of sulfate esters of polyethylene glycol ethers of fatty alcohols, alkyl sulfate surfactants, and mixtures thereof.

11. The detergent composition of Claim 7 wherein said auxillary surfactant is selected from the group consisting of salts of sulfate esters of polyethylene glycol ethers of fatty alcohols, alkyl sulfate surfactants, and mixtures thereof.

12. A liquid detergent composition comprising:

- (a) from about 0.5% to about 10% sodium methyl cocoyl taurate;
- (b) from about 0.5% to about 10% sodium lauroyl sarcosinate; and
- (c) from about 1% to about 30% sodium laureth sulfate; wherein the weight ratio of said taurate to said sarcosinate is from about 1:3 to about 3:1 and wherein the total level of surfactant present is from about 2% to about 40%.

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13. 1. An aerosol detergent composition comprising:

- (a) from about 0.1% to about 7.5% of at least one taurate surfactant;
- (b) from about 0.1% to about 7.5% of at least one sarcosinate surfactant; and
- (c) from about 1% to about 20% of at least one auxiliary surfactant;

wherein the weight ratio of said taurate surfactant to said sarcosinate surfactant is from about 1:3 to about 3:1 and wherein the total level of surfactant present is from about 2% to about 30%.

14. A paste detergent composition comprising:

- (a) from about 1% to about 20% of at least one taurate surfactant;
- (b) from about 1% to about 20% of at least one sarcosinate surfactant; and
- (c) from about 3% to about 50% of at least one auxiliary surfactant;

wherein the weight ratio of said taurate surfactant to said sarcosinate surfactant is from about 1:3 to about 3:1 and wherein the total level of surfactant present is from about 5% to about 70%.



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